NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT
P.O. BOX 418
TRENTON, NEW JERSEY 08625

2004 Work / Quality Assurance Project Plan:

COOPERATIVE COASTAL MONITORING PROGRAM

Prepared By: _____
Virginia Loftin, Project Officer
Division of Watershed Management

Reviewed By: _____

Debra Waller, Quality Assurance Officer
Office of Quality Assurance

COOPERATIVE COASTAL MONITORING PROGRAM

EPA Approval

Helen Grebe _____
EPA Region II Project Officer
Division of Environmental Science and Assessment

Donna Ringel _____
Quality Assurance Officer
Division of Environmental Science and Assessment

County Program Coordinator Approvals

Patricia Diamond _____
CCMP Coordinator
Atlantic County Health Department

Kevin Thomas _____
CCMP Coordinator
Cape May County Health Department

Richard Spillatore _____
CCMP Coordinator
Middlesex County Health Department

Ann Marie Fournier _____
CCMP Coordinator
Monmouth County Health Department

Rae Ferrara _____
CCMP Coordinator
Ocean County Health Department

1.0 Project Name: Cooperative Coastal Monitoring Program (CCMP)

2.0 Requested By: Division of Watershed Management, New Jersey Department of Environmental Protection (NJDEP)
Environmental Protection Agency (EPA) Region II as part of the BEACH Act

3.0 Date of Request: February 2004

4.0 Date of Project Initiation: FY04 / FY05

5.0 Project Officer: Virginia Loftin
Division of Watershed Management

6.0 Quality Assurance Officers:

6.1 Overall: Debra Waller, Office of Quality Assurance

6.2 Laboratory:

6.2.1 Monmouth County Health Department (MCHD) - Becky Cosgrove, Laboratory Supervisor

Ocean County Utilities Authority (OCUA) - Robert Grant, Laboratory Director

Atlantic County Utilities Authority (ACUA) – Steve Buckanin, Laboratory Supervisor

Cape May County Health Department (CMCHD) - Ann Melchiorre, Laboratory Supervisor

Aqua Pro-Tech Labs (for Middlesex County) – Brian Wood, Laboratory Supervisor

7.0 Project Description:

7.1 Objective and Scope:

The NJDEP administers the CCMP through the County Environmental Health Act (CEHA), N.J.A.C. 7:18 et seq., to evaluate nearshore coastal water quality. The program provides a consistent format for water quality analyses and their application to coastal zone management strategies and real-time response to public health concerns.

The New Jersey Department of Health and Senior Services (NJDHSS) regulates public bathing at recreational sites in the State of New Jersey as per the State Sanitary Code, Chapter IX (Public Recreational Bathing), N.J.A.C. 8:26-1 et seq.

This program will evaluate coastal water quality represented by enterococcus samples collected from designated public recreational bathing sites on the Atlantic coast and estuary shorelines of New Jersey. Enterococcus samples will also be measured at designated environmental sites along the coast and back bays.

7.2 Data Usage:

The Division of Watershed Management will provide this data to the NJDHSS to coordinate required closings and reopenings of public bathing sites as incorporated in Chapter IX (Public Recreational Bathing) of the State Sanitary Code, N.J.A.C. 8:26-1 et seq. If enterococcus concentrations exceed the standard of 104 per 100 ml of sample for two consecutive days the bathing beach will be closed. The beach will reopen when subsequent monitoring indicates that the concentration is within the standard. When beach closings are necessary the County or Local health agency will post a sign at the beach.

Counties will submit water monitoring data to NJDEP in electronic format after each sampling event. This data will be reported via e-mail to EPA staff on a daily basis. Annual (or more frequent if required) data will be transferred to EPA's CDX node which can then transfer the data to STORET. Beach conditions, beach closings and the reasons for beach closings will be posted on the NJDEP web page (www.njbeaches.org) and on the NJDEP Sandline (800-648-SAND) each weekday and on weekends if conditions change. That data will also be transmitted to EPA on an annual basis.

The sampling data will be used in initiating pollution source investigations and remedial actions. Enterococcus data may be used by enforcement agencies in NJDEP to guide them to contaminated areas in need of further investigation and remediation. The enterococcus data may be used as background levels for any enforcement actions that require this information, but will not be used as the sole basis for enforcement action.

The data will be added to the present CCMP database and the NJDEP GIS. Geometric means will be calculated and graphed to determine problem beaches in need of future evaluation and investigation. Trends will also be reviewed on a station-by-station and county-by-county basis. The data will be compiled, analyzed, and compared to surface water quality standards.

The annual report will discuss results from the seasons sampling. If problem areas arise then the State, County and Municipality will coordinate efforts to remediate the situation.

7.3 Monitoring Network Design and Rationale:

There are a total of 186 ocean stations and 139 bay stations in the CCMP. Each station represents either an

historic, present day or prospective bathing beach or an environmental area where nonpoint sources of pollution may be impacting the water body. County and local health agencies, in consultation with NJDEP and NJDHSS, select the stations before the beginning of each summer season. The locations of the stations are reviewed annually, but remain relatively constant. New stations are added and old stations are deleted when the locations of the recreational beaches are shifted or when pollution sources are discovered and remediated. Almost all of the ocean stations are "recreational" monitoring stations, which coincide with recreational beaches used by the public and supervised by lifeguards. However, five of the ocean stations are "environmental" monitoring stations, located in areas closed to recreational water activities because of recurring water quality or safety problems. Though each recreational monitoring station is associated with a recreational beach, not all ocean recreational beaches have a monitoring station. Samples from one recreational beach can be representative of water quality at several adjacent beaches, if there is no break between the beaches and no potential pollution sources such as sewage treatment plant discharges, coastal lake discharges or tidal flows from inlets. Therefore, limited field and laboratory resources need not be consumed by having a monitoring station associated with every recreational beach. However, a beach's proximity to pollution sources can preclude the use of more distant monitoring stations to represent that beach. The beach in question will require its own monitoring station. All bay recreational bathing beaches do have monitoring stations.

The Appendix lists the number, municipality and location of each CCMP station. Each site is designated as either an environmental or recreational site; all ocean stations are designated recreational unless noted otherwise (see Appendix). Beaches are generally named for the street where they are situated. All stations have been identified using global positioning system technology and stored on GIS. Samples are collected in approximately the same area each week, generally in front of the lifeguard stands. Each site has a distinct number for easy recognition. Station numbers beginning in "1" are ocean stations and "0" are bay stations. County designations are included in the code (i.e., "AC" for Atlantic County, "MX" for Middlesex County.)

7.4 Monitoring Parameters and Frequency of Collection:

The program runs from May through September (the recreational bathing season). Sampling for the season shall commence at least two weeks prior to the official start of the season (Memorial Day) in May so as to identify water quality problems that may have developed over the winter. The final required sampling for the season shall end the Tuesday after Labor Day in September.

Samples will be collected once per week as recommended by the U.S. Environmental Protection Agency's *National Beach Guidance and Required Performance Criteria for Grants*, preferably on Monday (or Tuesday if Monday is a holiday). Sampling on these specified weekdays will coincide with the period of time immediately after peak usage of and highest stress on the sewage infrastructure.

Each participating health department will be responsible for collecting the samples and will train all samplers in collection methods as stated in NJDEPE, Field Sampling Procedures Manual (Chapter 7) Trenton, NJ, 1992; and In Chapter IX (Public Recreational Bathing) of the State Sanitary Code, N.J.A.C. 8:26-1 et seq.

For recreational bathing stations, if the initial enterococcus concentration is above the primary contact standard of 104 per 100 ml of sample then samples will be collected on subsequent days until the concentration decreases to within the standard. In addition, there is bracket sampling of the stations with elevated concentrations in order to evaluate the extent of the problem. Bracketing of the station means

sampling to either side of the station at locations that take into consideration potential pollution sources, nearby bathing or monitoring stations or any other impediment to water flow, to determine the extent of the contamination. Sanitary surveys as defined in N.J.A.C. 8:26-1.3 are also conducted at the site to determine possible sources of bacterial contamination. Concentrations in excess of the standard at environmental sites do not require resamples. Sampling will be performed regardless of weather or tide conditions as long as the sampler determines conditions to be safe and a representative, valid sample can be collected.

If the result of the microbiological water quality resample is unsatisfactory, or if the sanitary survey discloses any condition which may present an imminent hazard to public health or safety, the bathing beach shall be closed for bathing. The local health authority shall immediately notify DHSS and DEP of closings of recreational bathing areas that are monitored in the CCMP. If the overall microbiological water quality data indicates that an area exceeds the bathing water microbiological quality standards as a consequence of certain environmental conditions, that bathing area shall be kept closed for a period of time following those environmental conditions as indicated by past sampling data. Further, if environmental conditions, such as heavy rainfall, cause sewage and/or stormwater infrastructure failures such as surcharging manholes, then bathing areas having the potential to be affected shall be closed or sampled at the discretion of the health authority. A bathing beach shall not be opened until the sanitary survey and, if necessary, appropriate sampling shows the microbiological water quality to be acceptable. The local health authority shall immediately notify the DHSS and DEP when a bathing beach that is monitored by the CCMP has been reopened.

Enterococcus samples will be analyzed by the methods specified below for each laboratory participating in the program. All samples will be collected in sterile containers and will be preserved on ice in transit to the laboratory as per NJDEPE, Field Sampling Procedures Manual (Chapter 2), Trenton, NJ, 1992.

7.5 Parameter Tables:

Atlantic County Utilities Authority for Atlantic County Health Department

Parameter	Enterococcus
# of Samples*	48 per week
Method	EPA Method 1600
Preservative	ice
Holding Time	6 hours

Monmouth County Health Department

Parameter	Enterococcus
# of Samples*	61 per week
Method	EPA Method 1600
Preservative	ice
Holding Time	6 hours

Ocean County Utilities Authority for Ocean County Health Department

Parameter	Enterococcus
# of Samples*	84 per week
Method	EPA Method 1600
Preservative	ice
Holding Time	6 hours

Cape May County Health Department

Parameter	Enterococcus
# of Samples*	128
Method	EPA Method 1600
Preservative	ice
Holding Time	6 hours

Aqua Pro-Tech Labs for Middlesex County

Parameter	Enterococcus
# of Samples*	4
Method	EPA Method 1600
Preservative	ice
Holding Time	6 hours

*Note: # of Samples is a minimum since additional samples may be collected based on initial results or under special circumstances (i.e., sewer line breaks, STP malfunctions).

Preservation Techniques: Once collected the sample will be cooled to 4°C in an ice chest.

8.0 Project Fiscal Information: NJDEP: Coastal Protection Trust Fund
EPA: BEACH Grant

9.0 Schedule of Tasks and Products:

Activity	Date
QA Work Plan Submitted	February 2004
QA Work Plan Approved	March 2004
Sample Collection	May-Sept. FY04/FY05
Sample Analysis	May-Sept. FY04/FY05
QA Review	March 2004
Data Storage	May-Sept. FY04/FY05
Data Summary	October 2004
Final Report	December 2004

10.0 Project Organization and Responsibility:

Project Officer:	Virginia Loftin (NJDEP)
	Ann Marie Fournier (MCHD)
	Rae Ferrara (OCHD)
	Pat Diamond (ACHD)
	Kevin Thomas (CMCHD)
	Richard Spilatore (MxCHD)

Sample Analysis:	County Health Department Laboratories
Laboratory QA:	Becky Cosgrove (MCHD),Bob Grant (OCUA), Ann Melchiorre (CMCHD), Brian Adams (Aqua Pro-Tech Labs for Middlesex County), Steve Buchanin (ACUA)
Overall QA:	Debra Waller (NJDEP)

11.0 Data Quality Requirements and Assessments:

11.1 Laboratory:

Detection, precision and accuracy limits and the methods used for all water analyses performed are listed in each laboratory's Standard Operating Procedure (SOP).

11.2 Data Representativeness:

Water samples will be collected at selected sites throughout five coastal counties: Monmouth, Ocean, Atlantic, Cape May and Middlesex. These samples will:

1) represent general bacterial water quality in the ocean and back bays
2) represent the nonpoint source affected areas of coastal water bodies
3) represent bathing-zone water quality

Bracket samples will be collected, when necessary, to show extent of contamination. Bracket samples are taken at either side of a bathing beach at locations that take into consideration pollution sources, nearby bathing or monitoring stations and any other impediments to water flow.

11.3 Data Comparability:

Sampling will be replicated for each station throughout the season. An overall bacteriological assessment will be possible as the same collection techniques and laboratory methods will be followed.

12.0 Water Sampling Procedures:

12.1 Sample Collection:

Samples will be collected directly in the sterile container following procedures set forth in NJDEPE, Field Sampling Procedures Manual (Chapter 7, Section F, Bacteriology), Trenton, NJ, 1992; and in Chapter IX (Public Recreational Bathing) of the State Sanitary Code, N.J.A.C. 8:26-1 et seq. (revised May 2000). Samples will be collected in sterile containers in an area with a stabilized water depth between the sampler's lower thighs and chest with the optimum depth being at the sampler's waist. The sample container shall be placed approximately eight to twelve inches below the water surface with the lid and stopper still attached. With the collector's arms extended to the front, the container shall be held near its base and downward at a 45-degree angle. The cap shall be removed and the container filled in one slow sweeping motion

(downward or horizontally, not upward.) The mouth of the container shall be kept ahead of the collector's hand and the container recapped while it is still submerged. The cap shall remain submerged during sample collection and care shall be taken not to touch the inner surfaces of the cap. During cold water sampling use of a sampling pole is permitted.

Samples shall be refrigerated or kept in an ice chest and held at a maximum of 4 degrees Celsius while being transported to the laboratory. Samples will be taken to a certified laboratory within six hours of collection for processing. Time and date of sample collection, tidal conditions, air and water temperature, rainfall, winds and other general conditions will be gathered in the field at the time of sampling and from weather forecasts for the site, and will be recorded on field sheets or in field logbooks by the sampler.

12.2 Sample Containers, Preservation, Holding Time:

Water sample containers will be prepared by each laboratory following the routine operational procedures described in the laboratory SOP. The holding time for this test shall be 6 hours.

12.3 Sample Identification Forms:

NJDEPE, Field Sampling Procedures Manual, Trenton, NJ 1992.

13.0 Sample Custody Procedures:

13.1 Field:

NJDEPE, Field Sampling Procedures Manual, Trenton, NJ 1992.

Chain of custody forms are required for this project.

13.2 Laboratory:

Laboratory Standard Operating Procedures

14.0 Documentation, Data Reduction and Reporting:

All data is sent by each participating county via e-mail to NJDEP at the end of the sampling season. All raw data will be stored in STORET.

14.1 Field Data:

NJDEPE, Field Sampling Procedures Manual, Trenton, NJ 1992.

14.2 Laboratory:

Laboratory Standard Operating Procedures

15.0 Data Validation:

15.1 Laboratory Data:

The laboratory has responsibility for full validation of report data. Validation of laboratory data occurs within the laboratory in accordance with procedures set forth in each Laboratory Standard Operating Procedures. Additional samples are analyzed when results indicate that further sampling is required, i.e., too numerous to count, sample is contaminated by sand or weeds, confluent growth, etc. Each laboratory manager is responsible for determining whether the data is acceptable.

15.2 Field Data:

Each participating health department validates its field data in accordance with:

NJDEP, Office of Quality Assurance. Guidance for Review of Environmental Measurement QC Data for Water Monitoring Projects (Procedure 2.0). Trenton, NJ Revised December 1984.

16.0 Performance and Systems Audits:

Laboratory:

Internal performance and system audits at each laboratory are discussed in each: Laboratory Standard Operating Procedures:

17.0 Corrective Action:

17.1 Field Operations:

Sampling will be postponed if unsafe sampling conditions exist or if representative samples cannot be obtained and will be canceled based on each field sampler's discretion. Sampling will be performed once the conditions are safe and representative samples can be obtained.

All changes in sampling locations or designation (environmental, recreational), time of sampling, and variations in sampling procedures or protocol will be reported in writing to DEP and annually to EPA.

17.2 Laboratory Operations:

Laboratory Standard Operating Procedures

18.0 Reports:

The annual summary report prepared by the Project Officer will include: